

Digital Trade Readiness, Absorptive Capacity, and Export Propensity: Evidence from Ghanaian Agro-Processing SMEs

Ezekiel Bosso Fermah, Dan Zhou

School of Economics and Management, Huzhou Normal University, Huzhou city, China

ABSTRACT

This study assesses the digital trade readiness of Ghanaian agro-processing SMEs ahead of the AfCFTA Digital Trade Protocol and examines whether absorptive capacity (AC) and social capital (SC) moderate the relationship between readiness and export propensity. A convergent mixed-methods design combines a survey of 387 firms, analysed with partial least squares structural equation modelling (PLS-SEM), and 28 interviews analysed through reflexive thematic analysis. Self-reported export status was validated against Ghana Export Promotion Authority archival records. Because the data are cross-sectional, the findings describe association rather than cause. Readiness is positively related to export propensity ($\beta = 0.412$, $p < 0.001$), and the association is stronger for firms with greater AC ($\beta = 0.187$, $p < 0.01$) and SC ($\beta = 0.163$, $p < 0.05$). A disaggregated, exploratory analysis suggests the moderating effect is carried mainly by the acquisition and exploitation dimensions, a pattern flagged for replication rather than offered as settled. Qualitatively, severe market-access barriers can override readiness. The cross-sectional design supports association, not causation; reverse causality cannot be excluded, and the dimension-level results are exploratory and may be underpowered. The validated instrument doubles as a diagnostic tool for locating readiness deficits by sub-sector and region, informing targeted, sequenced capability-building during Protocol implementation. The paper offers a validated, Protocol-anchored, six-dimension firm-level readiness instrument and integrated mixed-methods evidence on AC and SC as moderators in an under-studied sector.

How to cite this paper: Ezekiel Bosso Fermah | Dan Zhou "Digital Trade Readiness, Absorptive Capacity, and Export Propensity: Evidence from Ghanaian Agro-Processing SMEs" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-10 | Issue-4, August 2026, pp.80-94, URL: www.ijtsrd.com/papers/ijtsrd141974.pdf



Copyright © 2026 by author (s) and International Journal of Trend in Scientific Research and Development Journal. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0) (<http://creativecommons.org/licenses/by/4.0>)



KEYWORDS: AfCFTA Digital Trade Protocol; digital trade readiness; SME export performance; Ghana.

1. INTRODUCTION

Adopted in February 2024, the African Continental Free Trade Area (AfCFTA) Digital Trade Protocol requires firms to handle electronic authentication, paperless trading, and data governance, capabilities most African SMEs currently lack (African Union, 2024). The stakes are large: full implementation could add \$450 billion to continental income by 2035 and lift 30 million people out of extreme poverty (Maliszewska et al., 2020). That estimate presupposes that the firms expected to comply already have the digital capabilities that the Protocol requires, something aggregate modeling cannot confirm. The assumption is crucial in Ghana, which is home to the AfCFTA Secretariat: Its agro-processing sub-sector (shea butter, horticulture, cassava, palm oil) generates \$3.83 billion in non-traditional exports (GEPA, 2024), yet 95% of surveyed SMEs are ignorant of

AfCFTA, 86% do not possess export certificates, and 92% are without trade finance (Doagbodzi, 2024). The gap between what the Protocol expects and what firms can do is wide.

Why do some agro-processing SMEs build digital trade readiness while others stay digitally isolated? Ghana's agro-processing sector is an extreme case of institutional voids, the missing intermediaries, regulatory frameworks, and contract-enforcement mechanisms that smooth market exchange in developed economies (Khanna & Palepu, 1997, 2010): formal business development services are thin outside the main cities, regulatory enforcement is still taking shape, and disputes are typically settled informally. That sparseness is a demanding test of whether firms can build digital capabilities through substitutes such as social capital and absorptive

capacity. The sector also runs from formal horticulture exporters with cold-chain logistics to informal shea cooperatives with little digital engagement (World Bank, 2022), making it well suited to testing boundary conditions.

The policy case comes down to timing. The Protocol has been adopted but is not yet in force, pending further State Party ratifications; Ghana and other signatories are now writing its provisions into domestic law, leaving a window for evidence-based intervention before the obligations bind (African Union, 2024). Evidence produced now can shape implementation rather than arrive too late to do anything but explain compliance failures.

Three gaps stand out. To conceptualise digital trade readiness and conduct a first measurement of the potential exporters of digital services in Africa) to the linear measure of national digital infrastructure (UNCTAD, 2023). Prior work does measure general export readiness (Doagbodzi, 2024) or national digital infrastructure, but, to our knowledge, none considers digital trade readiness as a concept related to the Protocol's obligations or relates firm abilities with the specific Protocol articles, meaning that we cannot know which provisions create the greatest burden on which sub-sectors. On the one hand: Absorptive capacity (Akrofi, 2026) as well as social capital (Easmon et al., 2019) have individually been associated with the performance of SMEs operating in Ghana, but none investigates them as co-moderators in the field of digital trade, and none conceptualizes absorptive capacity based on its four constituents in a resource-limited environment. Thirdly, on the theoretical level: To Zahra and George's (2002) four-dimensional model equally weighting all the dimensions of a un-tested in resource-constrained SMEs founded on the premise that firms may shorten the process by consolidating the stages or collapse the process into a shorter pathway

To address these gaps, this study pursues five research questions:

RQ1. What is the digital trade readiness profile of Ghanaian agro-processing SMEs across sub-sectors, firm sizes, and geographic zones?

RQ2. Which firm-level characteristics predict digital trade readiness?

RQ3. Do absorptive capacity and social capital moderate the relationship between digital trade readiness and export propensity?

RQ4. Which dimensions of absorptive capacity (acquisition, assimilation, transformation,

exploitation) moderate the readiness-propensity relationship?

RQ5. What qualitative mechanisms explain the quantitative relationships, and what boundary conditions do they reveal?

The design is convergent mixed-methods: quantitative evidence comes from the 387 surveyed firms, and the 28 interviews supply the mechanisms behind the numbers. Hypotheses are tested with partial least squares structural equation modelling (PLS-SEM); reflexive thematic analysis draws out the explanatory themes. Section 2 reviews the literature and develops the hypotheses, Section 3 sets out the methodology, Section 4 reports findings by research question, Section 5 discusses implications and limitations, and Section 6 concludes.

2. Literature Review and Hypotheses

2.1. Digital Trade Readiness and the AfCFTA Context

Digital trade readiness grew out of the wider e-commerce readiness literature, which has never quite captured regulatory compliance. Reviewing theoretical frameworks for e-commerce in developing countries, Boateng et al. (2011) identified technology acceptance, institutional theory, and innovation diffusion as the dominant lenses, but observed that none of them handles the compliance side of digital trade. More recent empirical work narrows the gap only partly: in Thai food-manufacturing SMEs, organisational readiness and knowledge acquisition predict digital transformation, but the construct still describes general capability rather than compliance with a specific binding instrument (Jewapatarakul & Ueasangkomsate, 2024). Neither speaks to what this study needs: a construct for compliance-oriented capabilities, the competencies a firm must have to meet binding obligations under agreements such as the AfCFTA Protocol.

The Protocol runs to 52 articles covering electronic authentication, paperless trading, digital payment interoperability, and data governance (African Union, 2024), and is unusually comprehensive against the wider field: digital trade provisions remain sparse and largely non-binding in most South-South trade agreements, with only about 23% addressing data protection and 8% restricting data localisation (Banga et al., 2021). Newer scholarship has analysed the Protocol's legal architecture (Mishra & Kugler, 2024) and proposed a research agenda for digital trade in Africa (Ferracane & Nordås, 2026), but like the Protocol text and Banga et al.'s analysis, it is pitched at the continental and policy level. None of it asks whether African SMEs can actually meet provisions

such as electronic certificates and interoperable payment systems.

Computable general equilibrium work supplies macro context but cannot substitute for firm-level assessment: Maliszewska et al. (2020) project that AfCFTA implementation could raise real income by 7% and lift 30 million people out of extreme poverty, with wage gains concentrated among unskilled workers and women. This view is top-down and does not address the bottom-up question this study cares about, namely whether the firms expected to comply actually can.

The closest that has been offered at national level are national digital readiness assessments which do not disaggregate at sector level. In Ghana, while an eTrade Readiness Assessment identified national-level gaps in e-commerce legislation and payment systems, the Ghana Statistical Service notes that half of agricultural enterprises used some digital tool in response to the pandemic, predominantly informal mobile money rather than any organised digitisation of trade transactions. Neither assessment is specifically tailored to a protocol-compatible firm-level, sector-specific construct of digital readiness for trade.

A significant amount of cross-country research highlights that increased adoption of digital technologies has led to more active participation in international trade for SMEs – based mostly on developed-country data and, partially, via improved productivity (An Hign & Bonvin 2024), whereas, in sub-Saharan Africa, the process of digitisation for SMEs is frustrated more by factors pertaining to market structures, and sociotechnical capabilities rather than a lack of the enterprises' intention to embark upon digitisation.

In all cases, the one measurement tool that is missing is firm-level and sector-specific in its application to digital trade readiness.

2.2 SME Export Readiness in Ghana

Studies of Ghanaian SME export readiness document severe deficits. Doagbodzi (2024) found that, of 250 Cape Coast SMEs, 95% lacked AfCFTA knowledge, 86% lacked export certificates, and 92% lacked trade finance. Neither this nor the broader export-readiness construct, which has itself been tied to superior SME export performance (Gerschewski et al., 2020), measures digital trade readiness as such; both index general export knowledge and preparedness rather than the digital, compliance-specific competencies at issue here.

Value chain analyses have mapped sub-sectoral variation in Ghanaian agro-processing, but not its

digital side. The World Bank (2022) found little digital engagement in Ghana's shea value chain, where documentation and payments still run through personal relationships, against GEPA's (2024) horticulture exporters competing on cold-chain logistics and electronic phytosanitary certificates. The contrast, near-zero digital infrastructure in shea against fairly sophisticated tools in horticulture, is the point: agro-processing is not one category, and national averages can mislead policy.

Institutional voids theory (Khanna & Palepu, 1997, 2010) helps explain the divergence: emerging markets lack the specialised intermediaries, regulatory frameworks, and contract-enforcement mechanisms that grease exchange in developed economies, leaving Ghanaian agro-processing firms to build their own substitutes or accept lower efficiency. Firms can even turn voids into advantages by developing compensatory capabilities (Khanna & Palepu, 2010) that, through the Resource-Based View, look like valuable, rare, hard-to-imitate resources sustaining advantage where institutions are thin (Barney, 1991; Wernerfelt, 1984). This study extends that logic to digital trade readiness: firms with stronger compensatory capabilities should do better in void-rich settings, motivating the hypothesis that SC and AC moderate the readiness-export relationship.

2.2. Absorptive Capacity, Social Capital, and the Readiness-Export Link

AC's direct effect on SME export performance is well established; its role as a moderator in digital trade is not. Lane et al. (2001) established its importance in international joint ventures, though formal multinational partnerships are far from informal Ghanaian agro-processing, and evidence from Vietnam and Bangladesh adds further positive associations (effect sizes 0.18-0.45) in designs that are overwhelmingly cross-sectional. Recent work increasingly treats AC as conditional: export performance runs through external knowledge search strategies (Ferrerias-Méndez et al., 2019), and AC and relational capital shape export performance with contractual governance moderating the effect (Ismail et al., 2024). No study tests whether AC strengthens the effect of digital trade readiness on export propensity, and none disaggregates the construct to pin down dimension-specific effects.

Multi-dimensional AC measurement has come a long way since Zahra and George (2002), yet it has rarely been applied in resource-constrained settings. Jansen et al. (2005) validated a 24-item instrument in large Dutch firms with formal R&D and found the dimensions contributing fairly evenly; Flatten et al. (2011) adapted it for German SMEs and found the

opposite balance, with smaller firms leaning on acquisition and exploitation more than on assimilation and transformation. Both confirm the four-dimensional model explains more than uni-dimensional alternatives, but their European, R&D-intensive samples look nothing like Ghanaian agro-processing SMEs, leaving open whether the model survives where institutional voids block formal assimilation and transformation. A similar pattern holds outside manufacturing: among Tanzanian sunflower-oil-processing SMEs, technological absorptive capacity raises firm performance largely through e-business innovation rather than directly (Changalima et al., 2025), suggesting a mediated rather than a direct pathway in some agro-processing contexts.

Several African studies confirm SC's direct effect on SME export performance, while its moderating role stays plausible in theory and untested in practice. Easmon et al. (2019) found SC the most influential predictor of Ghanaian SME export performance, with the structural dimension outweighing the relational and cognitive ones; Musteen et al. (2010) showed network ties predict how fast firms internationalise across countries. Both treat SC as a determinant in its own right rather than as something that might amplify or dampen the effect of digital readiness. This gap matters because informal, network-based learning can substitute for formal capability-building: a well-connected firm may hear about export opportunities through contacts and never develop the digital competencies the Protocol requires.

One distinctive feature of African commerce is that digital platforms themselves serve as SC infrastructure. Timcke (2022) documented WhatsApp groups operating as trade networks where buyers and sellers swap information and coordinate logistics in place of formal e-commerce platforms, while Aker and Mbiti (2010) found mobile money and SMS services cut search costs and support trade over

distance. Neither links these informal networks to formal digital trade compliance, so it remains unknown whether the SC built in WhatsApp trade groups helps or hinders Protocol-aligned capabilities such as electronic documentation and data governance.

2.3. Theoretical Framework

Three theories anchor the study. Dynamic Capabilities Theory (DCT) describes how firms adapt to a changing environment by sensing opportunities, seizing them, and transforming their resource base (Teece, 2007; Teece et al., 1997). Absorptive Capacity Theory (ACT) describes how firms turn external knowledge into organisational capability through acquisition, assimilation, transformation, and exploitation (Cohen & Levinthal, 1990; Zahra & George, 2002). Social Capital Theory (SCT) describes how network relationships move knowledge and enable economic action (Nahapiet & Ghoshal, 1998), building on earlier work treating social capital as a community-level asset (Putnam, 2000). Read together, they imply that digital trade readiness should raise export propensity (DCT), that the effect should be larger where firms can absorb new knowledge (ACT), and that network ties should amplify the benefits of readiness (SCT).

Applied to African SME exports, DCT holds up but comes with caveats: absorptive capacity strengthens entrepreneurial innovation and competitiveness among Ghanaian food-processing SMEs (Akrofi, 2026), and foreign market knowledge predicts export performance among non-traditional Ghanaian exporters (Abubakari et al., 2022), though both rely on cross-sectional designs that leave the direction of causation open. The AC and SC literatures reviewed in §2.3 share the same blind spot: no study asks whether sensing, seizing, and transforming carry over to the specific demands of AfCFTA Protocol compliance. Figure 1 brings the three theories and the hypothesised relationships together.

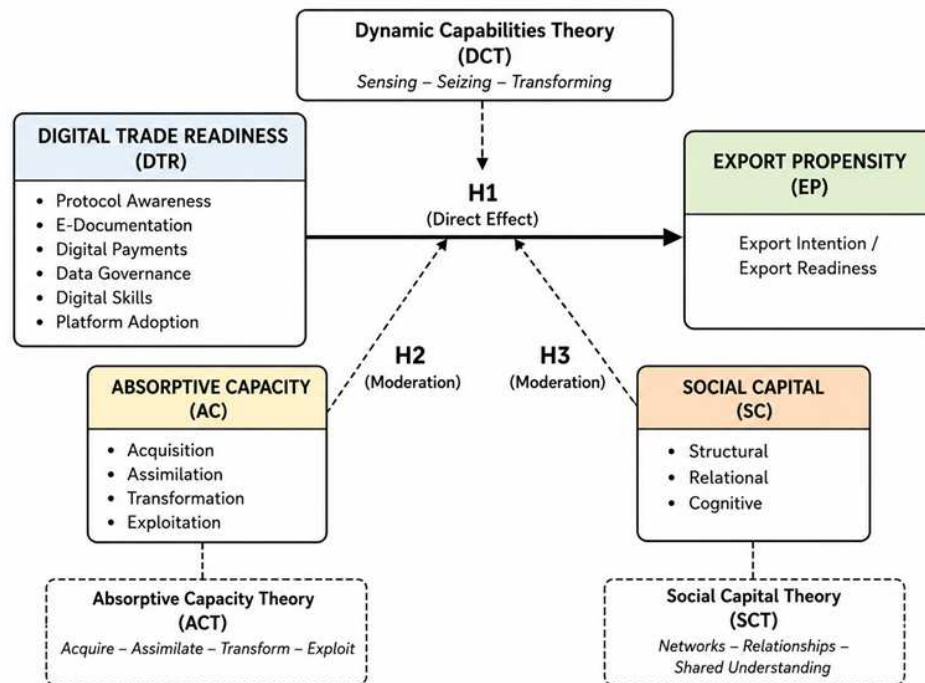


Figure 1. Conceptual framework

2.4. Gaps and Hypothesis Development

Three gaps persist. No study has built a firm-level digital trade readiness construct aligned with the Protocol; none has tested AC and SC as simultaneous moderators in the digital trade domain or split AC into its four dimensions for resource-constrained settings; and the mechanisms linking institutional requirements to firm-level outcomes, especially the part played by institutional voids in shaping capability, remain undertheorised. These gaps give rise to five hypotheses (Figure 1). H1: digital trade readiness is positively associated with export propensity. H2: firm characteristics (sub-sector, size, zone) significantly predict readiness. H3a: AC positively moderates the readiness-propensity relationship. H3b: SC positively moderates the readiness-propensity relationship. H4: institutional awareness explains additional variance. H5: significant sub-sectoral and regional disparities exist.

3. Methodology

3.1. Research Design and Rationale

The study uses a convergent parallel mixed-methods design (Creswell & Plano Clark, 2017): quantitative and qualitative data were collected at the same time, analysed separately, and merged through joint interpretation. The survey establishes how large the relationships among digital trade readiness, export propensity, and the moderators are and whether they are statistically significant (RQ1-RQ4); the interviews explain why those relationships hold (RQ5), allowing both convergence validation, where the strands agree, and boundary-condition identification, where they diverge. The survey is cross-sectional and measures preparedness rather than impact, fitting a Protocol not yet in effect.

Safeguards against bias work at several levels. To limit common method bias (CMB), procedural steps separated the predictor and criterion measures in time, varied the scale anchors, and assured respondents of anonymity. Four statistical checks back these up: Harman's single-factor test, the marker variable technique, a multitrait-multimethod (MTMM) comparison of self-reported export status against Ghana Export Promotion Authority archival records, and the full collinearity variance inflation factor (VIF) test. Measurement invariance across sub-sectors and zones was checked with the Measurement Invariance of Composite Models (MICOM) procedure (Henseler et al., 2016), so group comparisons reflect real differences rather than measurement artefacts.

3.2. Sample

The target population is agro-processing SMEs across four sub-sectors, spanning micro (fewer than 10 employees), small (10-49), and medium (50-249) firms. Of 520 firms approached, 412 took part (79.2%); after dropping 25 incomplete and 22 ineligible responses, 387 usable cases remained, an effective response rate of 74.4%. This rate is well above the 10-30% typical of self-completed SME surveys; it reflects interviewer-administered recruitment through sub-sector associations and cooperatives rather than self-completion, which raises participation but may also narrow the sample toward firms reachable through those networks. A non-

response check (Armstrong & Overton, 1977) found no significant differences between early and late respondents (all $p > 0.26$). Data were collected between March and June 2025, through face-to-face (68%) and telephone (32%) interviews. The qualitative component consisted of 18 SME interviews, with saturation reached at 14, and 10 key informant interviews with policymakers and industry experts.

3.3. Scale Development and Validation

The digital trade readiness scale was built over four phases (Churchill, 1979; DeVellis, 2017). Phase 1 produced 42 items drawn from the Protocol's operational requirements (Articles 5-15), UNCTAD's (2023) eTrade Readiness Assessment framework adapted from the national to the firm level, and 12 exploratory SME interviews that surfaced context-specific capabilities; these 12 scale-development interviews formed a separate, earlier wave, distinct from the 28 main-study interviews in §3.2, so total fieldwork comprised 40 interviews. Items were written in English, translated into Twi and Dagbani, and back-translated. Phase 2 had eight experts judge content validity (CVI = 0.92), leading to 9 items dropped and 8 reworded. Phase 3 ran a pilot exploratory factor analysis ($N = 150$) that extracted six factors accounting for 68.4% of variance; removing 9 more items left 25 items across six dimensions (Cronbach's $\alpha = 0.72$ -0.87). Phase 4 confirmatory factor analysis ($N = 387$) returned acceptable fit (CFI = 0.94, TLI = 0.93, RMSEA = 0.048). Full item-level results are available from the authors.

A second-order formative specification is appropriate here because the dimensions capture distinct capability domains (inter-correlations of 0.18-0.52): they are not interchangeable, and dropping any one would leave a conceptual gap (Jarvis et al., 2003). The model used expert-derived weights (Protocol awareness 0.20, e-documentation 0.22, digital payments 0.18, data governance 0.15, digital skills 0.15, platform adoption 0.10); a sensitivity analysis using equal weights returned identical PLS-SEM results.

3.4. Measures

Export propensity is a composite of export status (0-2) and export intention (5-point Likert), equally weighted and standardised after Morgan & Katsikeas (1997); a sensitivity analysis using intention alone gave identical coefficients. Absorptive capacity is measured with Zahra and George's (2002) four-dimensional scale, with reliabilities of 0.82 (acquisition), 0.80 (assimilation), 0.85 (transformation), and 0.83 (exploitation). Social capital uses Easmon et al.'s (2019) scale, with reliabilities of 0.78 (structural), 0.81 (relational), and 0.74 (cognitive). Institutional awareness records recognition of four support programmes (composite 0-4). Controls are firm size, sub-sector, zone, age, and owner education.

3.5. Analytical Strategy

Analysis followed Sarstedt et al. (2022) in six stages. (1) ANOVA with post-hoc Tukey HSD tests profiled readiness across sub-sectors, firm sizes, and regions. (2) Multiple and hierarchical regression examined the predictors of readiness and propensity. (3) PLS-SEM in SmartPLS 4 tested the hypotheses, using 5,000 bootstrap samples for 95% bias-corrected confidence intervals; PLS-SEM suited this model because it accommodates both reflective and formative constructs, the aim is prediction-oriented hypothesis testing, and the sample ($N = 387$) clears the usual minimum of ten times the largest number of paths pointing at any construct. The outer model was judged on indicator reliability (loadings > 0.70), internal consistency (composite reliability > 0.70), convergent validity (AVE > 0.50), and discriminant validity (Fornell-Larcker and HTMT < 0.85). (4) MICOM tested measurement invariance across sub-sectors and zones. (5) Endogeneity was assessed with the Durbin-Wu-Hausman specification test and a control function approach. (6) Qualitative data were analysed through reflexive thematic analysis (Braun & Clarke, 2006; 2021), coded independently by two researchers (Cohen's kappa = 0.81) and integrated in a joint display matrix. CMB was tackled with procedural remedies, Harman's test, the marker variable technique (Lindell & Whitney, 2001), and the MTMM comparison (self-reported vs. archival $r = 0.87$, $N = 124$).

4. Findings

4.1. Sample Characteristics and Common Method Bias Assessment

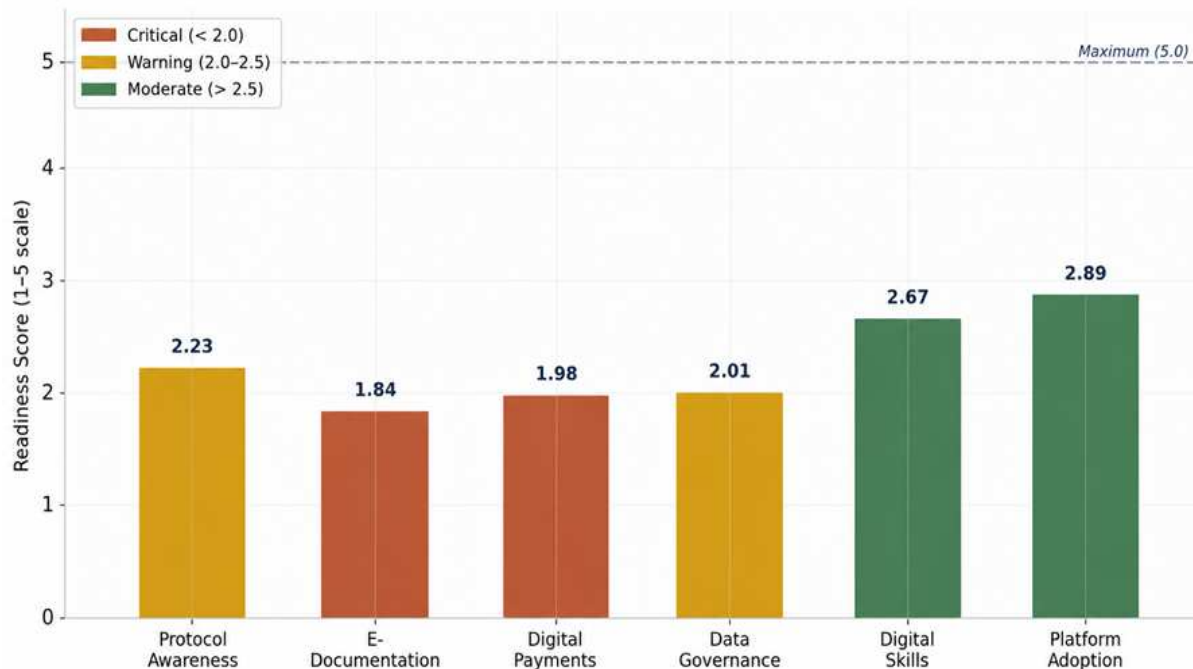
The sample (Table 1) was 42.1% micro, 38.5% small, and 19.4% medium enterprises, and by sub-sector 31.3% cassava, 26.1% shea, 23.8% horticulture, and 18.9% palm oil. Only 11.6% were currently exporting. The four CMB checks all came back reassuring: Harman's test put the first factor at 26.8% of variance, the marker variable's smallest correlation was $r = 0.02$, and self-reported export status matched archival records at $r = 0.87$; this validates the export-status component of export propensity only, since the export-intention component cannot be checked against an external archive. Taken together with the procedural remedies, they indicate CMB is not a serious threat, clearing the way for the readiness profile that answers RQ1.

Table 1. Sample characteristics (N = 387)

Characteristic	n	%
Firm size		
Micro (<10 employees)	163	42.1
Small (10–49)	149	38.5
Medium (50–249)	75	19.4
Sub-sector		
Cassava	121	31.3
Shea butter	101	26.1
Horticulture	92	23.8
Palm oil	73	18.9
Zone		
Coastal	147	38.0
Middle belt	132	34.1
Northern	108	27.9
Export status		
Current exporter	45	11.6
Previous exporter	90	23.3
Never exported	252	65.1

4.2. Readiness Profile and Predictors (RQ1, RQ2)

Overall readiness was low ($M = 2.34$, $SD = 0.87$, on a 5-point scale) and varied significantly across sub-sector, firm size, and zone (Table 2). Figure 2 plots readiness by dimension: platform adoption scored highest ($M = 2.89$; 78.3% social media, 54.8% mobile money use); digital skills came next ($M = 2.67$; only 23.1% could run an e-commerce platform); digital payments ($M = 1.98$) and data governance ($M = 2.01$) were weakest (12.7% had any cross-border payment experience; 91.2% could not describe data-flow rules); Protocol awareness sat low-middle ($M = 2.23$; 87.3% unable to name core provisions).

**Figure 2. Digital trade readiness by dimension**

Horticulture scored highest ($M = 3.12$), cassava lowest ($M = 1.89$); medium firms scored well above micro firms; coastal firms above northern ones. Benchmarked against a required level of 3.8, the aggregate deficit is -1.46, leaving firms at roughly 62% of the capability the Protocol is taken to require, a gap matched in comparable low-resource settings, where emerging-market SMEs reportedly lack systematic digital trade capabilities, especially e-documentation and payment interoperability (Pingali et al., 2023), suggesting the deficit is systemic rather than Ghana-specific.

Table 2. ANOVA results

Variable	M	SD	F	p	η^2
Sub-sector			14.27	<.001	.101
Horticulture	3.12	0.76			
Shea butter	2.41	0.82			
Palm oil	2.23	0.85			
Cassava	1.89	0.79			
Firm size			18.63	<.001	.088
Medium	3.08	0.71			
Small	2.41	0.78			
Micro	1.97	0.84			
Zone			11.84	<.001	.058
Coastal	2.78	0.82			
Middle belt	2.31	0.79			
Northern	1.84	0.76			

A multiple regression on export propensity was significant overall ($F(6,380) = 18.47$, $p < 0.001$, R-squared = 0.226), with three significant predictors: e-documentation ($\beta = 0.218$, $p < 0.001$), digital skills ($\beta = 0.167$, $p < 0.01$), and platform adoption ($\beta = 0.143$, $p < 0.05$). The hierarchical regression behind H4 told a different story: firm characteristics explained 31.7% of the variance in readiness ($p < 0.001$), but adding institutional awareness barely moved the model (Delta R-squared = 0.012, $\beta = 0.089$, $p = 0.08$), so H4 is not supported at conventional levels. Only 12.4% of firms recognised any support programme at all.

4.3. PLS-SEM Results (RQ2, RQ3, RQ4)

The measurement model showed satisfactory reliability and validity (Table 3).

Table 3. Correlation matrix and discriminant validity

	1	2	3	4	5	6
1. DTR	(.72)					
2. EP	.41	(.68)				
3. AC	.38	.35	(.74)			
4. SC	.34	.31	.29	(.71)		
5. IA	.28	.24	.26	.22	(.69)	
6. FS	.31	.27	.23	.21	.19	(.65)
HTMT max	.67	.64	.61	.58	.54	.52

Note. DTR = Digital Trade Readiness; EP = Export Propensity; AC = Absorptive Capacity; SC = Social Capital; IA = Institutional Awareness; FS = Firm Size.

The structural model (Table 4) explained 38.4% of the variance in export propensity (this PLS estimate exceeds the earlier OLS figure of 0.226 because it adds the AC and SC moderators), 31.7% in readiness, and 22.1% in institutional awareness. All Q-squared values were above zero, indicating predictive relevance.

Table 4. PLS-SEM structural model

Path	β	95% CI	P	f ²
Direct effects				
DTR → EP (H1)	0.412	[0.298, 0.526]	<.001	.198
FS → DTR (H2)	0.287	[0.189, 0.385]	<.001	.095
SS → DTR (H2)	0.156	[0.058, 0.254]	.002	.028
GZ → DTR (H2)	-0.178	[-0.276, -0.080]	<.001	.034
IA → DTR (H4)	0.089	[-0.012, 0.190]	.080	.008
Moderation				
DTR × AC → EP (H3a)	0.187	[0.073, 0.301]	.001	.042
DTR × SC → EP (H3b)	0.163	[0.052, 0.274]	.012	.031
Exploratory: AC dimensions				
Acquisition	0.089	[0.015, 0.163]	.018	.012
Assimilation	0.043	[-0.034, 0.120]	.280	.003
Transformation	0.051	[-0.024, 0.126]	.190	.004
Exploitation	0.112	[0.041, 0.183]	.002	.018

Digital trade readiness is positively associated with export propensity, supporting H1 (Table 4); the medium effect size makes readiness substantively important, though the model accounts for only 38.4% of the variance (the rest plausibly market access, trade finance, buyer relationships, and macroeconomic stability, none measured here), so this attribution is conjectural. Readiness is in turn predicted by firm size, sub-sector, and geographic zone, supporting H2.

Both absorptive capacity and social capital positively moderate the readiness-propensity relationship, supporting H3a and H3b (Table 4; Figure 3); against Cohen's (1988) benchmarks for small, medium, and large f-squared values, both effects count as small but are nonetheless significant and, given the cross-sectional design and sample size, theoretically meaningful.

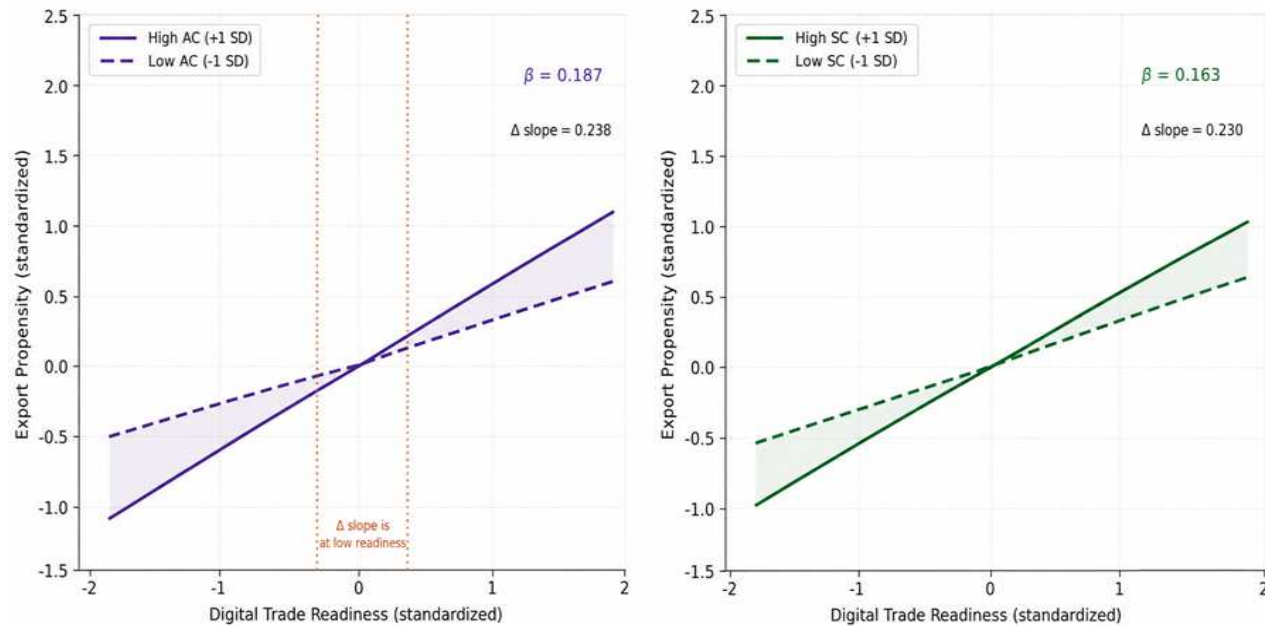


Figure 3. Simple slope analysis of moderation effects

Disaggregating AC for RQ4 shows the moderation concentrated at the ends of the process: only acquisition and exploitation significantly moderate the relationship; assimilation and transformation do not (Table 4; Figure 4). Because four dimension-level interactions were tested without correcting for multiple comparisons, these results are exploratory: a Benjamini-Hochberg correction keeps both flagged, but the stricter Bonferroni threshold leaves only exploitation standing. One tentative reading is that resource-constrained SMEs compress AC into an acquire-exploit pathway, though with assimilation and transformation non-significant rather than zero, this remains conjecture. That the significant dimensions are the two endpoints, with the non-significant ones the intermediate steps that turn knowledge into routines, is worth following up, but cannot be carried by two significant and two non-significant coefficients alone.

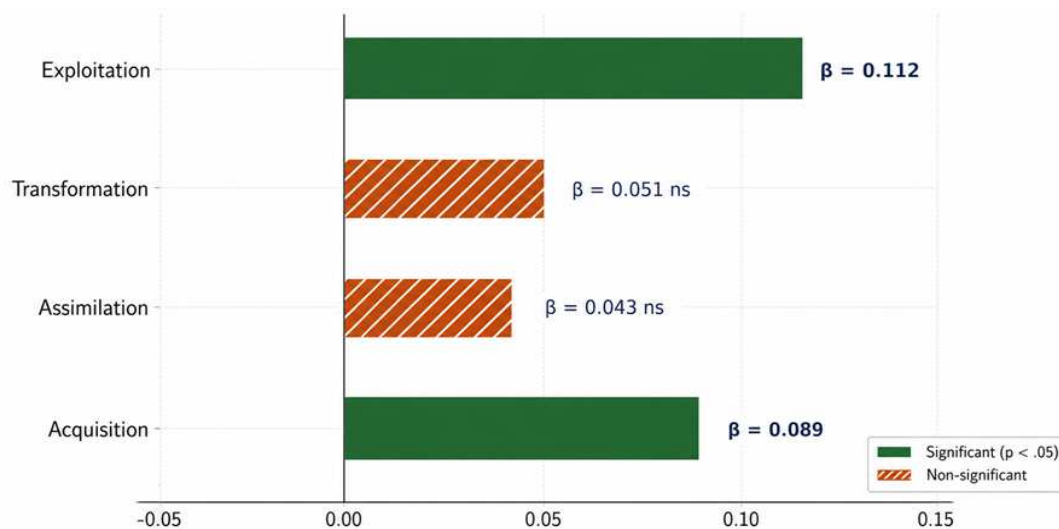


Figure 4. Exploratory absorptive capacity dimension moderation effects

This is broadly consistent with evidence from other low-resource settings, with one qualification: in Vietnam, Bui Van et al. (2025) found absorptive capacity raising export performance among manufacturing SMEs ($\beta = 0.161$, $p < 0.01$) without disaggregating it by dimension, so it corroborates the general AC effect rather than the acquire-exploit pattern reported here. Whether the dimension-level compression observed in this sample extends to other low-resource contexts cannot be established from these data and is left to replication.

MICOM established configural and compositional invariance, with scalar invariance only partial: four of the six dimensions showed no group differences ($p > 0.05$), and the two that did, e-documentation ($p = 0.03$) and digital payments ($p = 0.04$), differed only slightly. Partial scalar invariance is acceptable for PLS-SEM group comparisons as long as most dimensions meet the criterion (Henseler et al., 2016). The endogeneity tests (DWH: chi-squared = 2.14, $p = 0.14$; control function: $\beta = 0.034$, $p = 0.42$) suggest endogeneity is unlikely to bias the estimates much, though the instruments are not beyond question. In the multi-group analysis, the readiness-propensity path was stronger for coastal firms ($\beta = 0.467$) than for northern ones ($\beta = 0.298$; difference = 0.169, $p = 0.02$).

4.4. Qualitative Findings (RQ5)

Reflexive thematic analysis produced six themes. Five line up closely with the quantitative results and explain the mechanisms behind them; one cuts against them (Table 5).

Theme 1 (Convergent): Knowledge acquisition channels differ systematically by sub-sector and network position. Horticulture exporters pick up digital trade knowledge mainly through buyer relationships and GEPA workshops. As a horticulture exporter in Tema put it: "GEPA invited us to a workshop on AfCFTA digital rules last year. That is how we learned about electronic certificates." Shea processors depend on cooperative networks and occasional NGO visits: "We heard about digital certificates from an NGO that visited our cooperative, but they only came once." Cassava processors rarely meet digital trade knowledge through any channel. This uneven access lies behind the large sub-sectoral differences in H2.

Theme 2 (Convergent): Trust-mediated adoption links SC to digital trade readiness. Firms embedded in dense, trust-based networks are more willing to try digital tools because their contacts vouch for them. A shea cooperative leader in Bolgatanga explained: "When my friend in another cooperative started using mobile money for shea sales, I felt confident to try it too." Isolated firms, lacking that trusted guidance, describe a fear of digital transactions, the mechanism behind H3b.

Theme 3 (Convergent): Organisational inertia blocks the move from potential to realised AC. Interviewees described learning what the digital requirements were but never reworking their business processes to absorb them: "We know about electronic certificates, but changing our internal processes requires time and staff training that we cannot afford." This maps onto the quantitative result that transformation does not significantly moderate the relationship: the bottleneck is reorganising the firm, not acquiring the knowledge.

Theme 4 (Convergent, inductive): Gendered digital exclusion widens readiness deficits in women-dominated sub-sectors. Shea processing, where women make up over 90% of the workforce, shows high platform adoption (WhatsApp) but weak data governance awareness, traced to less access to formal training, less time for digital work because of unpaid care responsibilities, and thinner representation in industry associations: "The men in the district association get invited to training, but they do not pass the information to us." The theme was not hypothesised; it emerged from the data.

Theme 5 (Convergent): Institutional fragmentation holds readiness back. Interviewees were consistently unsure which institution to approach. A Ministry of Trade official acknowledged: "We have many programmes, but coordination is weak." A district agriculture officer added: "We do not have the staff or budget to inform farmers about them. By the time information reaches the village level, it is outdated." This is why H4 finds such low institutional awareness (12.4%) despite the number of programmes on paper: they exist, but SMEs cannot find their way to them.

Theme 6 (Divergent): Readiness without opportunity. Several firms with high digital trade readiness still do not export, held back by market access barriers. A horticulture exporter explained: "We have electronic certificates, digital payments, everything, but our European buyer cancelled orders due to currency fluctuations. Digital readiness does not help when the market disappears." The reverse also happens, with some low-readiness firms exporting on the back of buyer-driven compliance: "We do not understand digital trade, but our European buyer sends someone to handle all the documentation." The theme marks a boundary condition for the readiness-

propensity link: it holds on average but fades when external barriers are severe or buyers shoulder the compliance work.

Five of the six themes (83%) converge with the quantitative results and validate them; Theme 6 diverges and exposes a limitation the numbers alone could not reveal. Table 5 lays out this integration theme by theme.

Table 5. Joint display matrix

Theme	Quantitative	Type	Mechanism	Implication
1. Knowledge channels	H2 supported	Convergent	Buyer networks vs. isolation	DCT: sensing varies
2. Trust-mediated adoption	H3b supported	Convergent	Trust reduces risk	SCT: relational key
3. Learning inertia	AC: Acq/Exp only	Convergent	Acquire and act quickly	ACT: compressed
4. Gendered exclusion	Not tested	Convergent	Women lack access	Boundary condition
5. Institutional fragmentation	H4 not supported	Convergent	Support maze	Awareness insufficient
6. Readiness w/o opportunity	H1 attenuated	Divergent	Market barriers override	Necessary not sufficient

5. Discussion

5.1. The Absorptive Capacity Compression Finding

The disaggregated analysis offers a first, tentative indication that Zahra and George's (2002) four-dimensional model may not behave the same way in every context: only acquisition and exploitation moderate the readiness-propensity relationship, pointing to resource-constrained SMEs compressing AC into an acquire-exploit pathway. Both effects are small (the acquisition effect even falls below Cohen's (1988) threshold for a small effect), so although significant, they add little explanatory variance; the analysis is exploratory, the sample cross-sectional, and effect sizes this size are normal for interaction terms in field studies and should not be oversold.

Three mechanisms could drive the compression: weak organisational systems for assimilation and transformation push firms toward informal networks and peer learning instead (Theme 2's trust-mediated adoption; Theme 3's firms that learn about requirements but lack the infrastructure to act on them); time pressure under an uncertain implementation timeline makes the intermediate steps costly; and informal value chains mean knowledge moves through social channels rather than an organisational R&D function. These reinforce rather than compete: voids push firms toward network dependence, time pressure deepens it, and informal value chains leave even an attempt at formal assimilation with no infrastructure to land on.

If this exploratory pattern held up under independent replication, it would point to a context-contingent qualification of Zahra and George (2002), not a settled refinement: where institutional voids run deep,

the AC process may split into a two-stage acquire-exploit model, with SC standing in for formal assimilation and transformation, compression sharpest where institutional support is weakest. A cross-country comparison could test this, for instance, whether Kenyan SMEs inside the M-Pesa ecosystem compress less than Ghanaian agro-processing firms with fewer formal intermediaries.

5.2. Boundary Conditions and Null Findings

The divergent theme, readiness without opportunity, marks an important boundary condition: on average readiness goes with export propensity, but the link weakens where market barriers are severe or buyers take on the compliance work. The structural model explains only 38.4% of the variance; the remaining 61.6% plausibly includes market access, trade finance, buyer relationships, and macroeconomic stability, none of which was measured. The figure is in line with other low-resource settings (Bui Van et al. (2025) explained 57.3% among Vietnamese manufacturing SMEs, with extra resource-based determinants in the model) and simply reflects that digital readiness is one determinant of export propensity among many.

Two hypotheses went unsupported. H4 (institutional awareness) returned only a marginal effect, suggesting that awareness counts for little without access to the programmes themselves; Theme 5, on institutional fragmentation, explains why. The non-significance of assimilation and transformation is also informative rather than empty: a null result here tells us which mechanisms are not operating in this context and so points future research and intervention design toward the ones that are.

5.3. Policy Implications

The macro projections make firm-level intervention look urgent: Maliszewska et al. (2020) project continent-wide income gains of 7%. But these gains assume firms that can comply, and without digital readiness, Ghanaian agro-processing SMEs are likely to capture a disproportionately small share of the AfCFTA's benefits.

Three policy recommendations follow, though they assume the readiness-propensity association reflects a capability effect rather than reverse causation (§5.4) or buyer-driven compliance (Theme 6); where buyers shoulder compliance or market access is closed, readiness-building alone does less. First, outreach: with only 12.4% of firms aware of any programme, a single-window portal or district liaison offices could close that gap before the Protocol binds. Second, targeting: cassava processors need foundational digital literacy, shea processors need e-documentation for EU traceability, horticulture exporters need payment interoperability. Third, sequencing: digital capability without market access may do little for exports, so readiness development should pair with buyer-seller matching platforms and trade finance guarantees; cooperatives offer a cheap diffusion channel, though with no training intervention evaluated, peer-facilitated versus formal training cost-effectiveness remains unquantified.

5.4. Limitations and Future Research

The cross-sectional design rules out causal inference. Reverse causality is a real concern: firms that already export may build digital capabilities to meet buyer requirements, so the readiness-propensity association could reflect experience rather than capability-driven entry. The Durbin-Wu-Hausman test and control function approach suggest endogeneity is not a major threat, but both lean on instruments whose validity is not fully established; panel designs following the same firms over time would identify the effect more cleanly.

The compression finding is exploratory and needs independent, pre-registered replication. Self-reported data carry some risk of subjective bias, though the MTMM check put them at $r = 0.87$ against archival records, and mixed face-to-face (68%) and telephone (32%) administration modes were not separately tested for mode effects. The geographic scope is limited to Ghana; Kenya or Nigeria might yield different profiles. Gender was not examined quantitatively despite the clear disparities the interviews surfaced. Finally, although 387 cases are adequate for PLS-SEM, the study may be underpowered for small interaction effects, so the non-significance of assimilation and transformation

could reflect statistical power rather than a true null; the dimension-specific results are best read as suggestive rather than settled.

6. Conclusion

This study examined digital trade readiness among Ghanaian agro-processing SMEs and tested whether AC and SC moderate its link to export propensity. Using a convergent mixed-methods design with 387 surveyed firms and 28 interviews, it found overall readiness low ($M = 2.34$) and varying substantially by sub-sector and region. The PLS-SEM model confirms a positive readiness-propensity association, moderated by both AC and SC; those moderation effects are significant but small, as interaction terms in field studies usually are.

A disaggregated, exploratory analysis suggests that resource-constrained SMEs may compress AC into an acquire-exploit pathway, plausibly because institutional voids block formal knowledge processing, time pressure makes the intermediate steps costly, and agro-processing value chains are largely informal. Because this pattern is exploratory and rests on small, partly non-significant effects, it is offered as a hypothesis for independent, pre-registered replication rather than as a refinement of Zahra and George's (2002) model.

The qualitative analysis adds a boundary condition: readiness and propensity move together on average, but the relationship weakens where market barriers are severe. The validated measurement model doubles as a diagnostic tool for locating priority deficits by sub-sector and region, giving Protocol implementation an evidence base. As African countries prepare for implementation, pairing digital capability-building with market access support offers the best chance the Protocol's gains reach the SMEs anchoring the continent's agricultural economy.

Conflicts of Interest

The authors declare no conflicts of interest.

Funding Statement

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Ethics Statement

No formal ethical review or institutional approval was sought for this study. Respondents were informed of the study's purpose, participation was voluntary, and responses were anonymised throughout data collection and storage.

References

- [1] Abubakari, A., Ofori, K. S., Boateng, H., N'Da, K., & Hinson, R. E. (2022). The effect of

- foreign market knowledge on SME export performance: A study of non-traditional SMEs in Ghana. *Global Knowledge, Memory and Communication*, 71(6/7), 546–563. <https://doi.org/10.1108/GKMC-03-2021-0054>
- [2] Achieng, M. S., & Malatji, M. (2022). Digital transformation of small and medium enterprises in sub-Saharan Africa: A scoping review. *The Journal for Transdisciplinary Research in Southern Africa*, 18(1), Article a1257. <https://doi.org/10.4102/td.v18i1.1257>
- [3] African Union. (2024). *Protocol on Digital Trade to the Agreement Establishing the African Continental Free Trade Area*. African Union Commission.
- [4] Aker, J. C., & Mbiti, I. M. (2010). Mobile phones and economic development in Africa. *Journal of Economic Perspectives*, 24(3), 207–232. <https://doi.org/10.1257/jep.24.3.207>
- [5] Akrofi, B. (2026). The role of absorptive capacity in strengthening entrepreneurial innovation and agribusiness competitiveness among food processing SMEs in Ghana. *Discover Agriculture*, 4(1), Article 7. <https://doi.org/10.1007/s44279-025-00466-3>
- [6] Añón Higón, D., & Bonvin, D. (2024). Digitalization and trade participation of SMEs. *Small Business Economics*, 62(3), 857–877. <https://doi.org/10.1007/s11187-023-00799-7>
- [7] Armstrong, J. S., & Overton, T. S. (1977). Estimating nonresponse bias in mail surveys. *Journal of Marketing Research*, 14(3), 396–402. <https://doi.org/10.1177/002224377701400320>
- [8] Banga, K., MacLeod, J., & Mendez-Parra, M. (2021). *Digital trade provisions in the AfCFTA: What can we learn from South-South trade agreements?* SET Working Paper, ODI.
- [9] Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/10.1177/014920639101700108>
- [10] Boateng, R., Molla, A., & Heeks, R. (2011). *E-commerce in developing countries: A review of theoretical frameworks*. In *Advancing e-commerce beyond readiness* (pp. 1–16). University of Manchester.
- [11] Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- [12] Braun, V., & Clarke, V. (2021). *Thematic analysis: A practical guide*. SAGE Publications.
- [13] Bui Van, V., Vo Huu, K., & Tran The, T. (2025). Export performance of Vietnamese manufacturing SMEs: A PLS-SEM test of resource-based determinants, absorptive capacity, and international competition. *Problems and Perspectives in Management*, 23(4), 602–619. [https://doi.org/10.21511/ppm.23\(4\).2025.41](https://doi.org/10.21511/ppm.23(4).2025.41)
- [14] Changelima, I. A., Ismail, I. J., & Amani, D. (2025). Driving SME performance through technological absorptive capacity and e-business innovation. *Sustainable Technology and Entrepreneurship*, 4(1), Article 100089. <https://doi.org/10.1016/j.stae.2024.100089>
- [15] Churchill, G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research*, 16(1), 64–73. <https://doi.org/10.1177/002224377901600110>
- [16] Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.
- [17] Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35(1), 128–152. <https://doi.org/10.2307/2393553>
- [18] Creswell, J. W., & Plano Clark, V. L. (2017). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications.
- [19] DeVellis, R. F. (2017). *Scale development: Theory and applications* (4th ed.). SAGE Publications.
- [20] Doagbodzi, R. (2024). Ghanaian small and medium-scale enterprises (SMEs') readiness for African continental free trade area (AfCFTA) implementation. *Journal of Business and Enterprise Development*, 12(1). <https://doi.org/10.47963/jobed.v12i.1508>
- [21] Easmon, R. B., Kastner, A. N. A., Blankson, C., & Mahmoud, M. A. (2019). Social capital and export performance of SMEs in Ghana: The role of firm capabilities. *African Journal of Economic and Management Studies*, 10(3), 262–285. <https://doi.org/10.1108/AJEMS-11-2018-0361>
- [22] Ferracane, M. F., & Nordås, H. K. (Eds.). (2026). *Digital trade in Africa: A research agenda*. European University Institute.

- [23] Ferreras-Méndez, J. L., Fernández-Mesa, A., & Alegre, J. (2019). Export performance in SMEs: The importance of external knowledge search strategies and absorptive capacity. *Management International Review*, 59(3), 413–437. <https://doi.org/10.1007/s11575-019-00379-6>
- [24] Flatten, T. C., Engelen, A., Zahra, S. A., & Brettel, M. (2011). A measure of absorptive capacity: Scale development and validation. *European Management Journal*, 29(2), 98–116. <https://doi.org/10.1016/j.emj.2010.11.002>
- [25] Gerschewski, S., Scott-Kennel, J., & Rose, E. L. (2020). Ready to export? The role of export readiness for superior export performance of small and medium-sized enterprises. *The World Economy*, 43(5), 1253–1276. <https://doi.org/10.1111/twec.12928>
- [26] Ghana Export Promotion Authority (GEPA). (2024). *Annual non-traditional export statistics report 2024*.
- [27] Ghana Statistical Service (GSS). (2020). *COVID-19 business tracker*.
- [28] Henseler, J., Ringle, C. M., & Sarstedt, M. (2016). Testing measurement invariance of composites using partial least squares. *International Marketing Review*, 33(3), 405–431. <https://doi.org/10.1108/IMR-09-2014-0304>
- [29] Ismail, M. D., Ahmad, S. Z., & Singh, S. K. (2024). Absorptive capacity, relational capital and export performance among SME exporters: The moderating effect of contract. *Journal of Knowledge Management*, 28(7), 2120–2139. <https://doi.org/10.1108/JKM-02-2023-0144>
- [30] Jansen, J. J., Van den Bosch, F. A., & Volberda, H. W. (2005). Managing potential and realized absorptive capacity: How do organizational antecedents matter? *Academy of Management Journal*, 48(6), 999–1015. <https://doi.org/10.5465/amj.2005.19573106>
- [31] Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A critical review of construct indicators and measurement model misspecification in marketing and consumer research. *Journal of Consumer Research*, 30(2), 199–218. <https://doi.org/10.1086/376806>
- [32] Jewapatarakul, D., & Ueasangkomsate, P. (2024). Digital organizational culture, organizational readiness, and knowledge acquisition affecting digital transformation in SMEs from food manufacturing sector. *SAGE Open*, 14(4). <https://doi.org/10.1177/21582440241297405>
- [33] Khanna, T., & Palepu, K. G. (1997). Why focused strategies may be wrong for emerging markets. *Harvard Business Review*, 75(4), 41–51.
- [34] Khanna, T., & Palepu, K. G. (2010). *Winning in emerging markets: A road map for strategy and execution*. Harvard Business Press.
- [35] Lane, P. J., Salk, J. E., & Lyles, M. A. (2001). Absorptive capacity, learning, and performance in international joint ventures. *Strategic Management Journal*, 22(12), 1139–1161. <https://doi.org/10.1002/smj.206>
- [36] Lindell, M. K., & Whitney, D. J. (2001). Accounting for common method variance in cross-sectional research designs. *Journal of Applied Psychology*, 86(1), 114–121. <https://doi.org/10.1037/0021-9010.86.1.114>
- [37] Maliszewska, M., van der Mensbrugghe, D., Pereira, M. F. S., Osorio Rodarte, I., & Ruta, M. (2020). *African continental free trade area: Economic and distributional effects*. World Bank. <https://doi.org/10.1596/978-1-4648-1559-1>
- [38] Mishra, N., & Kugler, K. (2024). International community in the global digital economy: A case study on the African digital trade framework. *International & Comparative Law Quarterly*, 73(4), 853–889. <https://doi.org/10.1017/S0020589324000290>
- [39] Morgan, R. E., & Katsikeas, C. S. (1997). Theories of international trade, foreign direct investment and firm internationalization: A critique. *Management Decision*, 35(1), 68–78. <https://doi.org/10.1108/00251749710160214>
- [40] Musteen, M., Francis, J., & Datta, D. K. (2010). The influence of international networks on internationalization speed and performance: A study of Czech SMEs. *Journal of World Business*, 45(3), 197–205. <https://doi.org/10.1016/j.jwb.2009.12.003>
- [41] Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23(2), 242–266. <https://doi.org/10.5465/amr.1998.533225>
- [42] Pingali, S. R., Singha, S., Arunachalam, S., & Pedada, K. (2023). Digital readiness of small and medium enterprises in emerging markets:

- The construct, propositions, measurement, and implications. *Journal of Business Research*, 164, Article 113973. <https://doi.org/10.1016/j.jbusres.2023.113973>
- [43] Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. Simon & Schuster.
- [44] Sarstedt, M., Ringle, C. M., & Hair, J. F. (2022). Partial least squares structural equation modeling. In C. Homburg, M. Klarmann, & A. Vomberg (Eds.), *Handbook of market research* (pp. 587–632). Springer. https://doi.org/10.1007/978-3-319-57413-4_15
- [45] Teece, D. J. (2007). Explicating dynamic capabilities. *Strategic Management Journal*, 28(13), 1319–1350. <https://doi.org/10.1002/smj.640>
- [46] Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533. [https://doi.org/10.1002/\(SICI\)1097-0266\(199708\)18:7<509:AID-SMJ882>3.0.CO;2-Z](https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509:AID-SMJ882>3.0.CO;2-Z)
- [47] Timcke, S. (2022). WhatsApp in African trade networks: Professional practice and obtaining attention in AfCFTA policy formation. *First Monday*, 27(10). <https://doi.org/10.5210/fm.v27i10.11610>
- [48] UNCTAD. (2023). *Ghana eTrade readiness assessment*. United Nations Publications.
- [49] Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal*, 5(2), 171–180. <https://doi.org/10.1002/smj.4250050207>
- [50] World Bank. (2022). *Ghana shea value chain development*. World Bank Group.
- [51] Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review*, 27(2), 185–203. <https://doi.org/10.5465/amr.2002.6587995>

